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Solar Based Grass Cutter

Mr. Adesh Shrikant Waghamare[1], Mr. Swayam Vijay Sawant[2], Mr. Samarth Mangesh Mohite[3], Mr. Vinayak Kiran Dhongadi[4], Prof. Mr. B. B. Patil[5]
Mechanical Engineering[1,2,3,4]
Professor, Mechanical Engineering[5]
Dr. Bapuji Salunkhe Institute of Engineering & Technology, Kolhapur
adeshwaghamare7@gmail.com , srajebhosale456@gmail.com ,samarthmohite010@gmail.com , vinayakdhongadi30@gmail.com , balirambpatil84@gmail.com

Abstract: *The solar based grass cutter is an eco-friendly and cost-effective machine designed to cut grass using renewable solar energy instead of conventional petrol or electric power sources. The system consists of a solar panel, rechargeable battery, DC motor, cutting blade, and supporting frame. The solar panel converts sunlight into electrical energy, which is stored in the battery and used to operate the motor that drives the cutting blade. This project aims to reduce fuel consumption, air pollution, noise, and maintenance cost associated with traditional grass cutters. The proposed machine can operate in both manual and automatic modes, making it suitable for gardens, lawns, farms, and public parks. The design focuses on simplicity, low cost, and ease of operation while ensuring efficient grass cutting performance. By using renewable energy, the solar grass cutter provides a sustainable solution for modern agricultural and landscaping needs.*

Keywords: Solar based grass cutter, solar panel, rechargeable battery, DC motor, cutting blade, renewable energy, eco-friendly machine, automatic and manual operation, sustainable technology, low operating cost

I. INTRODUCTION

A solar based grass cutter is an eco-friendly machine used to cut grass by using energy generated from sunlight instead of petrol or electricity from the grid. It works with the help of a solar panel, which converts solar energy into electrical energy and stores it in a rechargeable battery. This stored energy is then used to run a DC motor that rotates the cutting blade to trim grass.The main aim of a solar grass cutter is to reduce fuel consumption, air pollution, noise, and operating cost. It is especially useful for gardens, farms, lawns, and public parks where regular grass cutting is required. Since it uses renewable energy, it is a sustainable and cost-effective solution compared to conventional petrol grass cutters.

II. LITERATURE REVIEW

Literature reviews on solar grass cutters highlight a shift toward eco-friendly, automated, and low-maintenance landscaping tools. These systems, utilizing solar panels, rechargeable batteries, and DC motors, provide a sustainable alternative to fossil fuel-powered mowers, reducing pollution and operating costs. Key research focuses on automating cutting using sensors (ultrasonic/IR) for obstacle detection, enhancing cutting mechanisms (linear blades), and improving battery management, with future trends targeting fully autonomous, AI-driven navigation.

Design & Components: Most designs incorporate a solar panel (usually 10-20W), a 12V DC motor, a rechargeable lead-acid or lithium-ion battery, and stainless steel cutting blades.

III. EXISTING SYSTEM

The existing grass cutting systems mainly use petrol engines or electric power from the grid to operate the cutting mechanism. Petrol-based grass cutters consume fossil fuels, which increases operating cost and produces harmful exhaust emissions causing air pollution. These machines also generate high noise and require frequent maintenance such as engine servicing, oil changes, and fuel refilling. Electric grass cutters depend on wired power supply, which limits mobility and

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creates safety issues due to cables. In addition, both types are not environmentally friendly and are less suitable for continuous use in gardens, farms, and public parks. Therefore, the existing systems are costly, noisy, and dependent on non-renewable energy sources.

IV. PROPOSED SYSTEM

The proposed system is a solar based grass cutter that operates using renewable solar energy to overcome the limitations of conventional grass cutting machines. The system consists of a solar panel, rechargeable battery, DC motor, cutting blade, frame, and wheel arrangement. The solar panel converts sunlight into electrical energy and stores it in the battery, which is then used to run the DC motor. The motor rotates the cutting blade to trim grass efficiently. The machine is designed to work in both manual and automatic modes, making it easy to operate. This system reduces fuel consumption, air pollution, noise, and maintenance cost. It is lightweight, portable, eco-friendly, and suitable for use in gardens, farms, lawns, and public parks. The proposed system provides a sustainable and cost-effective solution for grass cutting applications.

Proposed System with Working

- Solar panel converts sunlight into electrical energy
- Electrical energy stored in rechargeable battery
- Battery supplies power to DC motor
- DC motor rotates cutting blade
- Blade cuts grass efficiently
- Wheels help in easy movement
- Operates in manual and automatic mode
- Eco-friendly and low maintenance system

V. METHODOLOGY

The methodology of the solar based grass cutter involves designing and developing a machine that utilizes solar energy for grass cutting. The process includes studying the working principle, selecting suitable components, fabricating the frame, assembling mechanical and electrical parts, and testing the system. The aim is to develop an eco-friendly, cost-effective, and efficient grass cutting machine powered by renewable energy.

Steps:

- Study of solar based grass cutter concept
- Selection of components (solar panel, battery, DC motor)
- Design and fabrication of frame
- Mounting of motor and cutting blade
- Installation of solar panel and battery
- Wheel arrangement for easy movement
- Electrical wiring and switch connection
- Testing under sunlight
- Performance evaluation and modification

VI. FUTURE SCOPE

- Addition of automatic navigation system
- Use of sensors for obstacle detection
- Increase battery capacity for longer operation
- Higher efficiency solar panel integration

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- Remote control using mobile application
- Lightweight and compact design improvement
- Use of AI based grass detection
- Fully autonomous grass cutting system

VII. CONCLUSION

The solar based grass cutter is an eco-friendly and efficient solution for grass cutting applications. It utilizes renewable solar energy to operate the cutting mechanism, reducing dependence on petrol and electricity. The system helps to minimize air pollution, noise, and operating cost while providing easy and safe operation. The design is simple, low-cost, and suitable for gardens, farms, and public parks. Thus, the solar grass cutter offers a sustainable and cost-effective alternative to conventional grass cutting machines.

REFERENCES

[1]. B. H. Khan — Non-Conventional Energy Resources, McGraw Hill Education.
[2]. G.D. Rai — Non-Conventional Energy Sources, Khanna Publishers.
[3]. R.K. Rajput — A Textbook of Electrical Technology, Laxmi Publications.
[4]. V.B. Bhandari — Design of Machine Elements, McGraw Hill.
[5]. P.C. Sharma — Production Engineering, S. Chand Publications